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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/807,944	03/24/2004	Francesco de Rege Thesauro	100209	5134
29050 7590 12/27/2007 STEVEN WESEMAN ASSOCIATE GENERAL COUNSEL, I.P. CABOT MICROELECTRONICS CORPORATION 870 NORTH COMMONS DRIVE AURORA, IL 60504			EXAMINER GEORGE, PATRICIA ANN	
			ART UNIT 1792	PAPER NUMBER
			MAIL DATE 12/27/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Advisory Action  
Before the Filing of an Appeal Brief**

Application No.

10/807,944

Applicant(s)

DE REGE THESAURO ET AL.

Examiner

Patricia A. George

Art Unit

1792

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 13 December 2007 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☐ The period for reply expires \_\_\_\_\_ months from the mailing date of the final rejection.  
b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**NOTICE OF APPEAL**

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

**AMENDMENTS**

3. ☒ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☒ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: \_\_\_\_\_.  
Claim(s) objected to: \_\_\_\_\_.  
Claim(s) rejected: 1-16.  
Claim(s) withdrawn from consideration: 17-36.

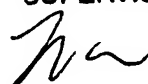
**AFFIDAVIT OR OTHER EVIDENCE**

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

**REQUEST FOR RECONSIDERATION/OTHER**

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
Changing pendency of claims requires further consideration.  
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☒ Other: See Continuation Sheet.

**NADINE G. NORTON  
SUPERVISORY PATENT EXAMINER**



Continuation of 13. Other: Applicants' arguments are not persuasive.

Applicants argue in section 3 of page 9, that one of skill would have to ignore the teaching of Small because the metal coating on an abrasive is not in the form of an ion in the composition, but fails to provide any evidence which teaches the metal coatings of abrasive particles in a composition do not become liberated into the solution.

Applicants argue in section 3 of page 9, that one of skill would have to ignore the teaching of Bringham because the source of the ions is not the same, as the reference of Small. The reference of Bringham teach calcium a source of ion, which is of the type provided by Small. Bringham is provided to teaching the quantity of metal ions known to be useful in compositions for polishing metals. Although Bringham may not be explicit about the ions from calcium in an example, Bringham clear teaches they of the group selected from and mere substitution make obvious the quantity of metal ion of calcium. As to applicants' assertion that one of skill would dismiss Bringham, examiner disagree, because if one of skill in the art where concerned with quantities of metal ion for enhanced metal polishing, Bringham teach said subject matter.

Applicants' argue in section 3 of page 9, that the reference of Sethuraman is misinterpreted to provide teaching of alpha alumina particles in CMP compositions, because Sethuraman teach fixed abrasives, and fails to teach the abrasives on the fixed pad are liberated. The liberation of the particles on a pad are well know to become liberated, be those skilled in the art. Geyer (6,911,059) provides evidence that one skilled in the art would have the understanding that it is inevitable that a number of fixed abrasives are liberated into the polishing composition:

See col.2, line 8 - col. 3, line 22, where Geyer teaches the following fundamental "A range of different configurations of the CMP processes used are known, a distinction substantially being drawn between four fundamental processes: a. the conventional CMP process; b. the fixed abrasive CMP process; c. the electrochemical-mechanical deposition process; d. the abrasive-free slurry process.

In practice, the latter two processes are only relevant to the CMP processing of surfaces containing copper as conductive material and furthermore are still in the development stage. In contrast, the first two processes mentioned, i.e. the conventional CMP process and the fixed abrasive CMP process, are of general importance in particular for the processing of polysilicon oxide layers, tungsten and copper layers, wherein context the conventional CMP process is almost exclusively used, on account of the drawbacks of the fixed-abrasive CMP process.

When fabricating highly integrated circuits, the conventional chemical mechanical polishing (CMP) is in widespread use for the planarization of dielectrics or for the indirect patterning of wiring planes, i.e. for the removal of elevated regions of a patterned surface.

In the case of the conventional CMP process, a liquid which is mixed with polishing grains, preferably of a high hardness, and in some cases contains basic chemicals, known as the "slurry solution", is introduced between that surface of a semiconductor wafer which is to be machined and a polishing pad.

The pad and the surface which is to be machined are in surface contact with one another and are moved relative to one another, so that the surface which is to be machined is abraded by the polishing grains moving between the two surfaces.

A topography selectivity is desired for efficient planarization of non-uniformly patterned surfaces. This means that more material should be removed from elevated regions than from regions lying at a lower level. In the case of chemical mechanical polishing, this cannot be ensured under all circumstances, in particular in the event of large and very small structures occurring together.

The polishing grains which move with the slurry solution can also penetrate into the lower-lying regions of the surface for material-removal purposes, so that overall complete planarization requires a greater amount of material to be removed than merely the layer thickness of the elevated structures.

In recent times, better results have been achieved by the process known as "fixed abrasive" CMP, wherein the polishing pad is covered with a polishing means, for example a polishing cloth, wherein the polishing grains are fixed in a polishing grain carrier and only project beyond the surface of the latter in certain regions. In the case of the fixed abrasive CMP, the polishing means and the surface which is to be machined are brought into contact with one another and are set in motion relative to one another. Depending on the specific device used, this can be effected by moving just one surface or both surfaces. In addition, if necessary it is possible to add suitable liquid chemicals in order to remove material by chemical means at the same time as by mechanical means. Since the polishing grains only interact with the surface that is to be machined at the actual points of contact between the polishing means and the surface which is to be machined, it is possible to achieve a particularly high level of topography selectivity by way of fixed abrasive CMP.

Strictly speaking, in a purely mechanical sense, the fixed abrasive CMP process is actually a grinding process rather than a polishing process, since the grinding or polishing grains cannot move freely, but rather are fixed in an unordered fashion in a carrier and in particular at the surface of the latter. Nevertheless, the term "polishing" has gained acceptance in general everyday usage and consequently it will continue to be used in this context.

It is inevitable that a number, in some cases a considerable number, of polishing grains will become detached from the carrier during the

machining operation, depending on the type of wafer and/or polishing means, so that, on the one hand, a "true" polishing process also always takes place and, on the other hand, the polishing means becomes blunt or aggressive over the course of time, with the result that the amount of material removed per unit machining time drops or increases. "

As to applicants' assertion, on page 9, that the references provided are unobvious, examiner disagree. All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention. The prior art included each element claimed although not necessarily in a single reference, and one of ordinary skill in the art could have combined the elements as claimed by known CMP compositions for metal polishing, and in combination, each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of the combination were predictable. Further, a predictable use of prior art elements according to their established functions to achieve a predictable result is prima facie obvious. See *KSR Int'l Inc. v. Teleflex Inc.*, 127 S Ct. 1727, 1741, 82 USPQ2d 1385, 1396 (2007).

As to applicants' assertion, on page 9 abridging 10, that the rejection of Small, Bringham, and Sethuraman fails to fall within the framework for obviousness as stated by the courts in the Graham factors, examiner disagree: The 103 rejection applied to applicants' claims, filed 11/01/2007 takes into consideration the scope and content of the prior art; the level of ordinary skill in the art; the differences between the claimed invention and the prior art; and objective evidence of nonobviousness. To summarize, the reference of Small teach composition for polishing metal, as applicants' with the exclusion of quantity of metal ions, and type of alpha particles; Bringham is made obvious because it provides quantity of metal ions and teaches applicants' types of metal ions are equivalent to the types used in specific examples; and Sethuraman is made obvious because it teaches the well known use of alumina type alpha particles in compositions for polishing metal. Although an explicit example of applicants' provided componets of the slurry for polishing metal are not provided by the teachings, examiner stand on the rejection as previously provided because each and every element was known in the art prior to the claimed invention. Absent unexpected results, a mere recitation of elements known to be effective as metal polishing compositions is not found to be patentably distinct.

